

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-19. (canceled).

20. (New) A safety vacuum cleaner including a measuring system for residual dust monitoring, comprising:

a housing including an air passage having an inlet and an outlet, at least a portion of said air passage being electrically grounded;

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a turbine at least partially disposed within said air passage, said turbine rotatable to move an air stream through said air passage, the air stream containing dust particles, wherein electrical charges associated with the particles are removed upon contact of the particles with said air passage;

a filter element disposed within said air passage; and

at least one electrode disposed within said air passage, said electrode conducting an electrical current responsive to contact with uncharged particles and emitting a measurement signal indicative of the amount of the particles in the air stream.

21. (New) The vacuum cleaner of Claim 20, wherein said electrode is positioned within said air passage downstream of said turbine and said filter element.

22. (New) The vacuum cleaner of Claim 21, wherein said outlet comprises an outlet tube having an open end portion, said electrode positioned within said open end portion.

23. (New) The vacuum cleaner of Claim 21, wherein said electrode is mounted within said air passage proximate said turbine.

24. (New) The vacuum cleaner of Claim 20, wherein said electrode is disposed within said air passage between said turbine and said filter element.

25. (New) The vacuum cleaner of Claim 24, wherein said electrode is one of:
mounted on said filter element, and
disposed proximate said filter element.

26. (New) The vacuum cleaner of Claim 24, wherein said air passage further comprises an intermediate tube between said turbine and said filter element, said electrode mounted within said intermediate tube.

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27. (New) The vacuum cleaner of Claim 24, wherein said turbine is disposed within a turbine housing and includes at least one blade, said electrode mounted within said turbine housing proximate said at least one blade.

28. (New) The vacuum cleaner of Claim 24, wherein said air passage includes a flow cross section, said electrode disposed across said flow cross section.

29. (New) The vacuum cleaner of Claim 20, wherein said electrode comprises a grid, said grid mounted within said air passage and electrically insulated.

30. (New) The vacuum cleaner of Claim 20, wherein said turbine is one of directly and artificially grounded.

31. (New) The vacuum cleaner of Claim 20, wherein said housing is one of directly and artificially grounded.

32. (New) The vacuum cleaner of Claim 20, wherein all portions of said air passage, besides said electrode, are one of directly and artificially grounded.

33. (New) The vacuum cleaner of Claim 20, further comprising a differential amplifier and a processing unit, said differential amplifier amplifying said measurement signal and conducting said measurement signal to said processing unit.

34. (New) The vacuum cleaner of Claim 33, wherein said processing unit carries out beatwise a comparison of said measurement signal with a desired value, said processing unit delivering an output signal when said measurement signal undershoots or exceeds said desired value.

35. (New) The vacuum cleaner of Claim 34, wherein said output signal results in one or more of the following:

- one of an optical and an acoustic alarm is given;
- said turbine is switched off;
- said filter element is changed; and
- a second turbine and filter element are activated.

36. (New) The vacuum cleaner of Claim 20, wherein said measurement signal is shown on a display, said displayed measurement signal corresponding to one or more of the following:

- a direct measurement signal;
- a correlating particle number;
- a proportional filter blocking; and
- a degree of filter damage.

37. (New) The vacuum cleaner of Claim 20, further comprising a storage unit, said storage unit receiving and storing said measurement signal.

38. (New) The vacuum cleaner of Claim 33, wherein said processing unit is interfaced with one of an external data processing installation and a computer.

39. (New) A safety vacuum cleaner including a measuring system for residual dust monitoring, comprising:

a housing including an air passage having an inlet and an outlet;

a turbine at least partially disposed within said air passage, said turbine rotatable to move an air stream through said air passage, the air stream containing dust particles, said turbine electrically grounded such that electrical charges associated with the particles are removed upon contact of the particles with said turbine;

a filter element disposed within said air passage; and

at least one electrode disposed within said air passage downstream of said turbine, said electrode conducting an electrical current responsive to contact with uncharged particles and emitting a measurement signal indicative of the amount of the particles in the air stream.

40. (New) The vacuum cleaner of Claim 39, wherein said outlet comprises an outlet tube having an open end portion, said electrode positioned within said open end portion.

41. (New) The vacuum cleaner of Claim 40, wherein said electrode is mounted within said air passage proximate said turbine.

42. (New) The vacuum cleaner of Claim 40, wherein said turbine is disposed within a turbine housing and includes at least one blade, said electrode mounted within said turbine housing proximate said at least one blade.

43. (New) The vacuum cleaner of Claim 39, wherein said air passage includes a flow cross section, said electrode disposed across said flow cross section.

44. (New) The vacuum cleaner of Claim 43, wherein said electrode comprises a grid, said grid mounted within said air passage and electrically insulated.

45. (New) The vacuum cleaner of Claim 39, wherein all portions of said air passage, besides said electrode, are one of directly and artificially grounded.

46. (New) The vacuum cleaner of Claim 39, further comprising a differential amplifier and a processing unit, said differential amplifier amplifying said measurement signal and conducting said measurement signal to said processing unit.

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47. (New) The vacuum cleaner of Claim 46, wherein said processing unit carries out beatwise a comparison of said measurement signal with a desired value, said processing unit delivering an output signal when said measurement signal undershoots or exceeds said desired value.

48. (New) The vacuum cleaner of Claim 47, wherein said output signal results in one or more of the following:

- one of an optical and an acoustic alarm is given;
- said turbine is switched off;
- said filter element is changed; and
- a second turbine and filter are activated.

49. (New) The vacuum cleaner of Claim 39, wherein said measurement signal is shown on a display, said displayed measurement signal corresponding to one or more of the following:

- a direct measurement signal;
- a correlating particle number;
- a proportional filter blocking; and
- a degree of filter damage.

50. (New) The vacuum cleaner of Claim 39, further comprising a storage unit, said storage unit receiving and storing said measurement signal.

51. (New) The vacuum cleaner of Claim 46, wherein said processing unit is interfaced with one of an external data processing installation and a computer.

52. (New) A safety vacuum cleaner including a measuring system for residual dust monitoring, comprising:

a housing including an air passage having an inlet, an outlet, and a flow cross section;

a turbine at least partially disposed within said air passage, said turbine rotatable to move an air stream through said air passage, the air stream containing dust particles, said turbine electrically grounded such that electrical charges associated with the particles are removed upon contact of the particles with said turbine;

a filter element disposed within said air passage; and

at least one electrode disposed within said air passage downstream of said turbine, said electrode shaped as a grid covering said flow cross section of said air passage, said electrode conducting an electrical current responsive to contact with uncharged particles and emitting a measurement signal indicative of the amount of the particles in the air stream.

53. (New) The vacuum cleaner of Claim 52, wherein said outlet comprises an outlet tube having an open end portion, said electrode positioned within said open end portion.

54. (New) The vacuum cleaner of Claim 53, wherein said electrode is mounted within said air passage proximate said turbine.

55. (New) The vacuum cleaner of Claim 53, wherein said turbine includes at least one turbine blade disposed within a turbine housing, said electrode mounted within said turbine housing proximate said at least one turbine blade.

56. (New) The vacuum cleaner of Claim 52, wherein all portions of said air passage, besides said electrode, are one of directly and artificially grounded.

57. (New) The vacuum cleaner of Claim 52, further comprising a differential amplifier and a processing unit, said differential amplifier amplifying said measurement signal and conducting said measurement signal to said processing unit.

58. (New) The vacuum cleaner of Claim 57, wherein said processing unit carries out beatwise a comparison of said measurement signal with a desired value, said processing unit delivering an output signal when said measurement signal undershoots or exceeds said desired value.

59. (New) The vacuum cleaner of Claim 58, wherein said output signal results in one or more of the following:

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- one of an optical and an acoustic alarm is given;
 - said turbine is switched off;
 - said filter element is changed; and
 - a second turbine and filter are activated.

60. (New) The vacuum cleaner of Claim 52, wherein said measurement signal is shown on a display, said displayed measurement signal corresponding to one or more of the following:

- a direct measurement signal;
- a correlating particle number;
- a proportional filter blocking; and
- a degree of filter damage.

61. (New) The vacuum cleaner of Claim 52, further comprising a storage unit, said storage unit receiving and storing said measurement signal.

62. (New) The vacuum cleaner of Claim 57, wherein said processing unit is interfaced with one of an external data processing installation and a computer.
